EXECUTIVE SUMMARY

AIRCRAFT ACCIDENT INVESTIGATION

F-16CG, S/N 88-0533

HILL AIR FORCE BASE, UTAH

17 OCTOBER 2001

On 17 October 2001, at 2116 Mountain Time, 0416 Universal Coordinated Time, an F-16CG, serial number 88-0533, departed the right side of Runway 32 after an aborted takeoff. The mishap aircraft (MA), assigned to the 388th Fighter Wing, 4th Fighter Squadron, at Hill Air Force Base, Utah, was part of a night, two aircraft ("two-ship") flight lead upgrade mission. There were no civilian injuries and only minor injuries sustained by the mishap pilot (MP). The F-16 sustained over $10,000,000 in damage.

During the takeoff roll the nose tire of the MA failed catastrophically. Analysis of the tire remains concluded the most likely cause was striking an object on the runway at high speed. As the nose tire disintegrated, it severed several critical wires on the nose gear assembly and damaged another vital component, rendering the nosewheel steering inoperative. This significantly reduced the MP's ability to steer the F-16. The MP noted an explosion, a column of flame on the left side of the canopy, and some deceleration and elected to abort the takeoff. He correctly applied abort procedures in an effort to stop the MA.

Approximately eleven seconds after initiating the abort the MA veered to the right but the MP was unable to maintain directional control. When it became evident the aircraft would depart the runway the MP successfully ejected. The MA continued off the prepared surface, across an unused taxiway, and came to a full stop after catching the right wingtip in the soft ground.

The primary cause of the mishap, supported by clear and convincing evidence, was a phenomenon known as reverse castering. After the tire failed the nosewheel ground down to a smaller radius. The new geometry forced the point of contact between the wheel and the runway to move forward of the nose landing gear strut axis, causing the nose wheel to caster in the direction opposite the direction the MP was attempting to move the aircraft. In this case the pilot was applying controls to return the MA to the left, which forced the nosewheel further to the right. As the aircraft slowed and the rudder became less effective, the MP lost sufficient authority from differential braking to counteract the effect of reverse castering.

The MP made every reasonable effort to maintain control of his aircraft, but the combination of the loss of nosewheel steering and the forces generated by the reverse castering exceeded his ability to keep the MA on the runway. The F-16 is inherently unstable on an unprepared surface at high speed; therefore the MP's decision to eject was prudent and proper.

Under 10 U.S.C. 2254(d) any opinion of the accident investigators as to the cause of, or the factors contributing to, the accident set forth in the accident investigation report may not be considered as evidence in any civil or criminal proceeding arising from an aircraft accident, nor may such information be considered an admission of liability of the United States or by any person referred to in those conclusions or statements.